```
     FILE 'LCA' ENTERED AT 14:36:29 ON 29 APR 2004
L1             8   S    G06F019-00/IC OR G01R033-44/IC OR G01N024-0
                   8/IC OR G01N033-18/IC OR G01N033-26/IC
L2           166   S    (OIL OR BITUMEN OR HYDROCARBON OR PETROLEUM
                   )(3A)(AMPLITUDE OR FRACTION OR RATIO OR PROPORTION### OR
                   PERCENT#### OR PER CENT####)
L3           199   S    (OIL OR BITUMEN OR HYDROCARBON OR PETROLEUM
                   )(5A)(AMPLITUDE OR FRACTION OR RATIO OR PROPORTION### OR
                   PERCENT#### OR PER CENT####)
L4           255   S    (WATER OR H2O OR AQ OR AQUEOUS)(5A)(AMPLITU
                   DE OR FRACTION OR RATIO OR PROPORTION### OR PERCENT#### OR PER
                   CENT####)
L5           124   S    T2 OR T(1W)2 OR (TRANSVERS####(3A)(TIME OR
                   RELAX######## OR T2 OR 2))
L6          1394   S    NMR OR M R OR MR OR MRI OR MAGNETIC
                   RESONANCE
L7            63   S    RELAXOM######## OR RELAXATION(3A)(DETERMIN#
                   ######## OR MEASUR#####)
L8            43   S    CUTOFF OR (CUT OR CUTT####)(W)OFF
L9          1394   S    L1 OR L6
L10          226   S    L5 OR (L7 OR L8)

     FILE 'TULSA, FROSTI, FSTA, HCAPLUS, WPIX, PASCAL, AGRICOLA, CABA' ENTERED
     AT 14:45:47 ON 29 APR 2004
L11       826427   S    L9
L12       253829   S    L10
L13       117233   S    L3
L14       158892   S    L4
L15        13812   S    L13 AND L14
L16          193   S    L11 AND L15
L17           41   S    L12 AND L15
L18           21   S    L16 AND L17
                   D TI 1-21
                   D MAX 17-19
                   D ALL 1-16 20-21
L19        32080   S    TRANSVERSE(3A)(TIME OR RELAX########) OR
                   SPIN SPIN
L20      1142622   S    AMPLITUD######## OR PEAK#######
L21          243   S    L15 AND L20
L22            2   S    L8 AND L21
L23            1   S    L22 NOT L18
                   D ALL
                   D MAX
L24          193   S    L11 AND L15
L25            5   S    L8 AND L24
L26           39   S    (L19 OR L20) AND L24
L27           29   S    (L25 OR L26) NOT (L22 OR L18)
L28            6   S    L27 AND EMULS#########
                   D TI 1-6
                   D ALL 1-4 6
                   D MAX 5
L29            3   S    L27 AND CUT
L30            2   S    L29 NOT L28
                   D TI 1-2
                   D ALL 1-2
L31            5   S    L16 AND DISTINGUISH#########
L32            3   S    L31 NOT (L29 OR L28 OR L22 OR L18)
                   D TI 1-3
                   D ALL 1-3
L33         3557   S    RELAXATION SPECTRUM
L34          641   S    L15 AND (REFERENCE OR STANDARD)
L35           31   S    AMPLITUDE INDEX
L36            0   S    L33 AND L34
L37            0   S    L34 AND L35
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NPL STIC
Search
4/29/2004
Database Search
History of Results
TAF

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L38          63   S    L34 AND (INDEX OR PEAK OR AMPLITUDE OR
                  CUTOFF OR (CUT OR CUTT###)(W) OFF)
L39           3   S    L34 AND DISTINGUISH########
L40          33   S    L32 OR (L29 OR L28 OR L22 OR L18)
L41           3   S    L39 NOT L40
L42          59   S    L38 NOT L40
L43          58   S    L42 NOT L41
L44           3 DUP REM L41 (0 DUPLICATES REMOVED)
L45          56 DUP REM L43 (2 DUPLICATES REMOVED)
                  D L44 TI 1-3
                  D ALL 1-3
                  D L45
L46          12   S    L45 AND OIL WATER
                  D TI 1-12
                  D ALL 1-12
L47          38   S    L45 AND INDEX
L48          42   S    L45 AND STANDARD
L49          16   S    L45 AND REFERENCE
L50          30   S    L47 AND L48
L51           9   S    L47 AND L49
L52           1   S    L50 AND L51
L53           5   S    (L47 OR L48 OR L49 OR L50 OR L51) AND (OIL
                  OR WATER)(3A) FRACTION
L54          48   S    (L47 OR L48 OR L49 OR L50 OR L51) AND (OIL
                  OR WATER)(3A) RATIO
L55           0   S    (L47 OR L48 OR L49 OR L50 OR L51) AND (OIL
                  OR WATER)(3A) PROPORTION
L56           4   S    L54 AND RELAX############
L57          16   S    (L51 OR L52 OR L53) OR L56
L58          16 DUP REM L57 (0 DUPLICATES REMOVED)
L59          12   S    L58 NOT L46
                  D TI 1-12
                  D ALL 1-11
                  D MAX 12
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L18 ==========

ANSWER 17 OF 21 WPIX COPYRIGHT THOMSON DERWENT on STN

AN 2002-527334 [56] WPIX Full-text

DNN N2002-417444 DNC C2002-149273

TI Determination of composition of sample containing bitumen and water by taking nuclear magnetic resonance spectrum of sample at low and high temperature, and calculating water and bitumen content from spectrum and differential spectrum.

DC H01 S03

IN ALLSOPP, K; KANTZAS, A; MARENTETTE, D; MIROTCHNIK, K

PA (UYTE-N) UNIV TECHNOLOGIES INT INC; (ALLS-I) ALLSOPP K; (KANT-I) KANTZAS A; (MARE-I) MARENTETTE D; (MIRO-I) MIROTCHNIK K

CYC 2

PI US 2002081742 A1 20020627 (200256)* 23 G01N033-26 <--
CA 2325348 A1 20020508 (200256) EN G01V003-14
US 6630357 B2 20031007 (200374) G01N024-00

ADT US 2002081742 A1 US 2001-773505 20010202; CA 2325348 A1 CA 2000-2325348 20001108; US 6630357 B2 US 2001-773505 20010202

PRAI CA 2000-2325348 20001108

IC ICM G01N024-00; G01N033-26; G01V003-14
ICS G01N024-08; G01N033-22; G01N033-24; G01R033-44; G01V003-32

AB US2002081742 A UPAB: 20020903

NOVELTY - The composition of a sample containing bitumen and water is determined by determining the nuclear magnetic resonance relaxation time spectrum of the sample at low temperature (preferably 0-50 deg. C) and high temperature (preferably 50-100 deg. C), respectively; creating a differential spectrum; and calculating water and bitumen content from the spectrum and differential spectrum.

DETAILED DESCRIPTION - Determination of composition of a sample containing bitumen or heavy oil and water in a porous media includes determining the nuclear magnetic resonance (NMR) transverse relaxation time (T2) spectrum of the sample at low temperature (preferably 0-50 deg. C) and at high temperature (preferably 50-100 deg. C), respectively; creating a differential spectrum (where Delta A = Ah - Al, Delta A = differential amplitude, Ah =

Applicants own Work of the Current Applicants Not Prior Art

amplitude at high temperature, and Al = amplitude at low temperature); and calculating water and heavy oil or bitumen content from the spectrum and differential spectrum. Water content is calculated by summing the amplitudes of low-temperature spectrum for the T2 range (where T2 is greater than 2.5 ms but less than 3000 ms), and dividing by the amplitude index (AI) of water. Heavy oil or bitumen content is calculated by summing the amplitudes of high-temperature spectrum in T2 range (in the differential spectrum where Delta A has a negative value) and the amplitudes of differential spectrum (where Delta A has a positive value), and dividing by the AI of oil at high temperature.

An INDEPENDENT CLAIM is included for a system for carrying out the method. The system comprises respective devices to determine NMR relaxation time at low and high temperature, create differential spectrum, determine water content and determine heavy oil or bitumen content.

USE - For the quantitative determination of the composition of a sample containing bitumen or heavy oil, water and solids (e.g. sand or clay)

ADVANTAGE - The method provides accurate results quickly, without the need for specialized equipment.

Dwg.0/26

TECH US 2002081742 A1UPTX: 20020903
TECHNOLOGY FOCUS - INSTRUMENTATION AND TESTING - Preferred Parameters: The low temperature is 20-40 (preferably 30) degreesC, and the high temperature is 70-90 (preferably 80) degreesC.
Preferred Method: The AI of heavy oil or bitumen at high temperature is determined by measuring the AI of heavy oil or bitumen sample isolated from the mixture sample.

FS CPI EPI
FA AB
MC CPI: H01-B03B2; H01-D12
EPI: S03-E07C; S03-E14F

L18 ==========

ANSWER 18 OF 21 WPIX COPYRIGHT THOMSON DERWENT on STN

AN 1998-272408 [24] WPIX Full-text
DNN N1998-213797 DNC C1998-085149
TI Formation producibility and water cut from NMR data for oil industry - involves using isolated pore model based on two bulk volume irreducible and free fluid index cut-off times.
DC H01 S03
IN BOWERS, M C
PA (CONO) CONOCO INC
CYC 20
PI **WO 9819183 A1 19980507 (199824)* EN 23 G01V003-00**
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: CA GB NO
US 5838155 A 19981117 (199902) G01R033-20
NO 9902060 A 19990429 (199932) G01V003-00
GB 2334589 A 19990825 (199936) G01V003-00
GB 2334589 B 20001025 (200055) G01V003-00
ADT WO 9819183 A1 WO 1997-US19247 19971027; US 5838155 A US 1996-739665 19961031; NO 9902060 A WO 1997-US19247 19971027, NO 1999-2060 19990429; GB 2334589 A WO 1997-US19247 19971027, GB 1999-7811 19990406; GB 2334589 B WO 1997-US19247 19971027, GB 1999-7811 19990406
FDT GB 2334589 A Based on WO 9819183; GB 2334589 B Based on WO 9819183
PRAI US 1996-739665 19961031
IC ICM G01R033-20; G01V003-00
ICS G01V003-175
AB WO 9819183 A UPAB: 19980617
The potential producibility and the proportion of water and oil produced from hydrocarbon bearing reservoirs can be predicted using an isolated model and nuclear magnetic resonance data. The model is based on the use of two bulk volume irreducible (BVI)/free fluid index (FFI) cut-off times: one based on small pores; and the other based on large pores with a throat size that will not permit movement of fluids therefrom.

In addition to determining the BVI and FFI cut-off based on the small pores, a second cut off time which accounts for large pores having a small throat size is determined to establish a more accurate model of producibility based on the volume of the pores associated with the immobile and mobile fluids.

ADVANTAGE - Predicts the proportion of water and oil that will be produced from a hydrocarbon bearing formation. Dwg.0/2

Does Not Determine Actual fractional/proportional water/oil measurements
NA TAF 4/30/2004

FS CPI EPI
FA AB
MC CPI: H01-A02A
EPI: S03-C02F1

L18 ==========

ANSWER 19 OF 21 WPIX COPYRIGHT THOMSON DERWENT on STN
AN 1983-D9989K [12] WPIX Full-text
DNN N1983-052660
TI Determination of residual oil-impregnation - by determining the linear time of relaxation and viscosity of residual oil whose ratio determines residual oil.
DC S03
IN KARLOVA, M V; NERETIN, V D; PETROSYAN, L G
PA (NUCG) NUCLEAR GEOPHYS CHEM
CYC 1
PI SU 928290 B 19820517 (198312)* 4
PRAI SU 1980-2947231 19800626
IC G01N024-08; G01V009-00
AB SU 928290 B UPAB: 19930925
Method is to determine unrecovered oil-impregnation during geophysical development in a deposit exploitation process, in which a water-mud solution sample is taken and the relative percentages of water and oil in the sample are determined and, additionally, twice the time of linear relaxation is determined using the atomic magnetic resonance of the residual oil in the sample.

A sample of the water-mud solution is taken and twice the time sf linear relaxation of the residual oil is determined, using its atomic magnetic resonance without electro-chemical processing. An additional sample is taken in an oil-emulsion or lime-mud solution. From the oil formation and the doubled time of the linear relaxation is determined, as before. The residual oil-impregnation is determined according to the measurement values of the linear relaxation times and the viscosity of the residual oil, by the correlation of the dependency of the time of linear relaxation of the oil to its viscosity. Bul.18/ 15.5.82
FS EPI
FA AB
MC EPI: S03-C04; S03-E07

Relation percentages
No actual Determination of water/oil Fractions
No weight determination
USA
TAF 4/30/2004

L18 ==========

ANSWER 3 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN
AN 2000:15811 TULSA Full-text
DN 732415
TI NMR MAGIC ANGLE SAMPLE SPINNING FOR MEASURING WATER AND HEAVY OIL SATURATION AND HIGH RESOLUTION RELAXOMETRY
AU WILSON, D M; LATORRACA, G A
CS CHEVRON RES & TECHNOL CO; CHEVRON PETROL TECHNOL CO
SO SOC CORE ANAL INT SYMP (GOLDEN, CO, 8/1-4/1999) PROC PAP NO SCA-9923, 1999 (12 PP; 25 REFS)
DT Conference; Conference Article
LA English
AB Nuclear magnetic resonance relaxometry and/or diffusion measurements can be used to distinguish oil and water fractions in rocks containing low density oils because the relaxation rates and diffusivities of the oil and water are significantly different. However, when core samples contain high density oils, the oil and water relaxation rates are indistinct and diffusion differences too small for straightforward saturation determination. Additionally, high density oils can have complicated T1 and T2 distributions as well as relaxation time constants that are too short to measure with low field relaxometry. The utility of using magic angle spinning (MAS) to remove the susceptibility broadening of the rock matrix is shown, making possible the resolution of the proton chemical shift. MAS measurements are used to determine water and oil saturations in diatomite samples containing oils with API gravity ranging from ca 10 to 27. The MAS measurements yield determinations of the oil and water saturations and estimates of the aromaticity of the oil, and extend relaxometry by obtaining separate T1s, Carr-Purcell and Hahn-Echo T2s of oil and water. The relaxation parameters thus obtained are not independent of spinning, and are discussed in the light of the relevant theory regarding MAS and field dependence.

Teaches Away From Use Low Field Relaxometry TAF 4/30/2004

L18 ==========

ANSWER 4 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN
AN 1999:22571 TULSA Full-text
DN 711772
TI EVALUATING A GEOLOGICAL FORMATION
IN ORABY, M
PA HALLIBURTON ENERGY SERVICE
PI EP 908722 19990414
AI EP 19980915
PRAI US 1997-931539 19970916
SO EUROPE 908,722, P 4/14/1999, F 9/15/1998, PR US 9/16/1997 (APPL 931,539)
(G01N-033/24; G01V-003/32) (10 PP; 13 CLAIMS)
DT Patent
LA English
AB A method of nuclear magnetic resonance logging is described. The method is helpful in formation evaluation and assists in the control of water in a formation and in identifying pay zones with high irreducible (or bound) water saturation. The latter application is critical in determining whether an oil-containing formation will produce fluid that has a low enough water/oil ratio to be profitable. The method makes use of the time (T2) for a hydrogen nucleus to dephase completely. T2 varies from one hydrogen nucleus to another, depending on the location of the hydrogen in the formation. When the hydrogen is adjacent an underground rock surface, it comprises immovable or bound water. When this bound water is affected by the magnetic field of an MRI tool, the rock causes the bound water to have a shorter T2. In this way, movable water may be differentiated from immovable water, and the formations that will produce oil profitably can be selected.
IC ICM G01N033-24
ICS G01V003-32
CC WELL LOGGING

NA TAF 4/30/2004

L18 ==========

ANSWER 5 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN
AN 1999:22563 TULSA Full-text
DN 711764
TI NMR LOGS FIND RESERVES BY-PASSED BY CONVENTIONAL ANALYSIS
AU HAMADA, G M; AL-BLEHED, M S; AL-AWAD, M N J
CS KING SAUD UNIV
SO OIL GAS J V 97, NO 39, PP 75-80, 9/27/1999 (ISSN 00301388; COLOR; 13 REFS)
DT Journal
LA English
AB Nuclear magnetic resonance (NMR) technology is proving to be an essential tool for evaluating formations, especially low-resistivity reservoirs. By differentiating between movable and immovable fluids, NMR logs have helped log analysts obtain more accurate reserve estimates than possible from conventional resistivity log interpretation, as shown by 4 examples in this article. In these examples, NMR data aided in identifying a zone's producibility, determining lithology independent porosity, and distinguishing between bound and free water. NMR data interpretation, however, requires caution and experience to ensure that suitable cutoff values are selected and that reliable conclusions are reached from the measured and calculated parameters, especially in carbonate reservoirs. Along with identifying low-resistivity and low-resistivity-contrast reservoirs, NMR logs can also provide (1) detailed porosity information and thus replace conventional porosity logs as the porosity and fluid type identifier; (2) accurate formation permeability, especially in complex lithology formations; (3) quantitative information about pore fluids such as clay-bound water, capillary-bound water, free water, oil, and gas; and (4) predictions concerning water-free oil production, in cases where the resistivity log indicates high-water saturation.
CC WELL LOGGING
SH *NUCLEAR MAGNETIC LOGGING
CT *FORMATION EVALUATION; *FREE FLUID INDEX; *INTERPRETATION; *WATER OIL RATIO; WATER SATURATION; WELL LOG; WESTERN DESERT
RN 1333-74-0 (HYDROGEN)
12627-13-3 (SILICATE)

NA TAF 4/30/2004

L18 ==========

ANSWER 6 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN
AN 1999:21409 TULSA Full-text
DN 710610
TI LOW-FIELD NMR DETERMINATIONS OF THE PROPERTIES OF HEAVY OILS AND

WATER-IN-OIL EMULSIONS
AU LATORRACA, G A; DUNN, K J; WEBBER, P R; CARLSON, R M
CS CHEVRON PETROL TECHNOL CO
SO 4TH SINTEF ET AL RECENT ADVANCES IN MAGNET RESONANCE APPL TO POROUS MEDIA **INT MTG (TRONDHEIM, NORWAY, 8/31/1997-9/3/1997) PROC; MAGNET RESONANCE** IMAGING V 16, NOS 5-6, PP 659-662, JUNE-JULY 1998 (ISSN 0730725X; 5 REFS)
DT Conference; Conference Article
LA English
AB Low-field (<50 mT) nuclear magnetic resonance (NMR) well-logging measurements are beginning to be used to obtain estimates of oil viscosity in situ. To build an interpretive capability, we made laboratory T1 and T2 relaxation measurements on a suite of high-density, high-viscosity crude oils. These measurements were also used to estimate oil viscosity and water fraction from T1 and T2 measurements on stable, water-in-oil emulsions. High-density, high-viscosity oils have components that relax faster than can be measured by nuclear magnetic resonance logging tools. This requires corrections to T2 logging measurements for accurate estimates of oil saturation and porosity. (c1998 Elsevier Science Inc.)
CC WELL LOGGING
SH *NUCLEAR MAGNETIC LOGGING
CT *CRUDE OIL; *EMULSION; *FLOW PROPERTY; *MAGNETIC FIELD; *MAGNETIC RESONANCE; *MAGNETISM; *MIXTURE; *NUCLEAR LOGGING; *NUCLEAR MAGNETIC RESONANCE; *PETROLEUM; *PHYSICAL PROPERTY; *RESONANCE; *SHEAR VISCOSITY; *VISCOSITY; *VISCOUS CRUDE OIL; *WATER IN OIL EMULSION; *WELL LOGGING; ALKALI METAL; ASPHALT; ASPHALTENE; BITUMEN; CHART; COMPOSITION; COMPOUND; DATA; DATA ANALYSIS; DATA PROCESSING; DENSITY; ELEMENT (CHEMICAL); EXPERIMENTAL DATA; GRAPH; HYDROCARBON COMPOUND; HYDROGEN; LABORATORY TESTING; LOGARITHM; MATHEMATICS; MICELLE; OIL DENSITY; OIL SATURATION; PARTICLE; PETROLEUM RESIN; POROSITY; POROSITY (ROCK); RELAXATION; SATURATION; SOLID HYDROCARBON; TESTING; VOLUME; WATER; WATER CONTENT; WELL LOGGING DATA
RN 1333-74-0 (HYDROGEN)
8002-05-9 (CRUDE OIL)
8002-05-9 (PETROLEUM)
8052-42-4 (ASPHALT)

No Determination of oil/water Fraction. No use of weights to determine the estimated Fraction
TAF 4-30-2004

L18 ==========

ANSWER 7 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN
AN 1999:4087 TULSA Full-text
DN 693288
TI ESTIMATION OF HYDROCARBON VISCOSITY WITH MULTIPLE TE (INTERECHO TIME) DUAL WAIT-TIME MRIL (MAGNETIC RESONANCE IMAGE LOG) LOGS
AU CHEN, S; GEORGI, D T; MINETTO, J C; OLIMA, O; GAMIN, H
CS WESTERN ATLAS LOGGING SERV; YAC PETROL FISC ARGENTINA
SO **ANNU SPE TECH CONF (NEW ORLEANS, 9/27-30/98) PROC (FORMATION EVALUATION** AND RESERVOIR GEOLOGY) PP 213-226, 1998 (SPE-49009; 8 REFS)
DT Conference; Conference Article
LA English
AB A successful example of using multiple TE dual wait-time (TW) log acquisitions for quantitative characterization of San Jorge Basin reservoir oil viscosity is reported. Previously, dual TW logs have been used to separate gas and oil, while dual TE logs have been used as a qualitative light oil indicator. Although theoretically simple, quantitative determination of viscosity from dual TE logs is complicated by several factors, including poor signal-to-noise ratio, difficulties in separating oil from water, and the uncertainty of internal gradient strength. Multiple TE acquisitions of dual TW logs were used to isolate the oil from the water signal. The values of viscosity of the reservoir fluids can be estimated from 3 NMR properties: intrinsic T2, apparent T2, and T1. In estimation of the apparent T2, a model was used that does not explicitly require knowledge of the internal gradient, thereby minimizing the effects arising from the uncertainty of the internal and tool gradient strengths. Since T1 and intrinsic T2 are estimated independently, the degree of agreement between the 2 values provides an indication of the reliability of the 2 estimates. The method has been used successfully in San Jorge Basin, Argentina.
CC WELL LOGGING
SH *NUCLEAR MAGNETIC LOGGING
CT *DATA PROCESSING; *FLOW PROPERTY; *FUNCTION (MATHEMATICS); *INTERPRETATION; *MAGNETIC RESONANCE; *MATHEMATICS; *NUCLEAR LOGGING; *NUCLEAR MAGNETIC RESONANCE; *PHYSICAL PROPERTY; *RESONANCE; *TIME FUNCTION; *VISCOSITY; *WELL LOG INTERPRETATION; *WELL LOGGING; AMPLITUDE; ARGENTINA; CRUDE OIL; DATA;

NA TAF 4-30-2004

DIFFUSION; FLUID PROPERTY; GRAPHICAL REPRESENTATION; IMAGING; LIGHT CRUDE OIL; MAGNETIC PROPERTY; MATHEMATICAL ANALYSIS; MOLECULAR STRUCTURE; NOISE; OIL PROPERTY; PERMEABILITY; PERMEABILITY (ROCK); PETROLEUM; PORE SIZE; POROSITY; POROSITY (ROCK); POROSITY DISTRIBUTION; RESERVOIR FLUID; SAN JORGE FM; SAN JORGE GULF BASIN; SATURATION; SATURATION (ROCK); SIGNAL LEVEL; SIGNAL TO NOISE RATIO; SOUTH AMERICA; SPECTRAL DATA; STRUCTURE; VISCOUS CRUDE OIL; WAVE AMPLITUDE; WELL LOGGING DATA

RN 8002-05-9 (CRUDE OIL)
8002-05-9 (PETROLEUM)

L18 ==========

ANSWER 8 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN

AN 98:20249 TULSA Full-text

DN 684520

TI FORMATION PRODUCIBILITY AND WATER CUT FROM NMR DATA USING ISOLATED PORE MODEL

Does not Measure actual Water/oil Fraction TAF 4-30-2004

IN BOWERS, M C

PA CONOCO INC

PI 19980507

AI 19971027

SO WORLD 98/19,183, P 5/7/98, F 10/27/97, PR US 10/31/96 (APPL 739,665) (G01V-003/00) (23 PP; 10 CLAIMS)

DT Patent

LA English

AB A method is described that predicts the percentage of water and oil that will be produced from a hydrocarbon-bearing formation. The method is based upon an Isolated Pore Model that uses more than one bulk volume irreducible (BVI)/free fluid index (FFI) cutoff time. In addition to determining the BVI and FFI cutoff based on small pores, a second cutoff time, which accounts for large pores having a small throat size, is determined in order to establish a more accurate model of producibility based on the volume of pores associated with the immobile fluids and the volume of pores associated with mobile fluids. These porosities, based on the Isolated Pore Model, are then used to determine the irreducible water saturation and relative permeability to water and oil and the percentage of hydrocarbons and water that will be produced.

CC WELL LOGGING

SH *NUCLEAR MAGNETIC LOGGING

CT *DATA ANALYSIS; *DATA PROCESSING; *FORMATION EVALUATION; *INTERPRETATION; *MATHEMATICAL MODEL; *MODEL; *NUCLEAR LOGGING; *PHYSICAL PROPERTY; *POROSITY; *POROSITY (ROCK); *WELL LOG INTERPRETATION; *WELL LOGGING; CALCULATING; CAVITY; CHART; COMPUTING; CONOCO INC; DATA; DETECTION; DETECTOR; DETERMINING; DISTRIBUTION; EQUATION; GEOLOGIC STRUCTURE; INSTRUMENT; MAGNETIC RESONANCE; MATHEMATICS; NUCLEAR MAGNETIC RESONANCE; OIL RESERVOIR; PORE; PORE GEOMETRY; PORE SIZE; PORE VOLUME; REMOTE SENSING; REMOTE SENSOR; RESERVOIR; RESONANCE; SATURATION; SHAPE; SONDE; TABLE (DATA); VOLUME; WATER SATURATION; WELL LOG; WELL LOGGING DATA; WELL LOGGING EQUIPMENT

L18 ==========

ANSWER 9 OF 21 TULSA COPYRIGHT 2004 UTULSA on STN

AN 97:22494 TULSA Full-text

DN 662328

TI A NEW CHARACTERIZATION OF BULK-VOLUME IRREDUCIBLE USING MAGNETIC RESONANCE

AU COATES, G R; MARSCHALL, D; MARDON, D; GALFORD, J

CS NUMAR; NUMAR AUSTRALIA

SO 38TH ANNU SPWLA LOGGING SYMP (HOUSTON, 6/15-18/97) TRANS PAP NO QQ, 1997 (14 PP; 16 REFS)

DT Conference; Conference Article

LA English

AB Irreducible water volume from the new magnetic resonance (MR) logging tools provides the log analyst with insight into a formation's permeability and its water-cut potential. However, the traditional T2 cutoff method to determine the bulk volume of irreducible water has been found to be inadequate for some formations and fluid conditions. A method to characterize bulk volume irreducible that addresses these issues is presented. The method is based on the premise that each pore size has its own inherent irreducible water saturation. Given that relaxation time is related to pore size, this method utilizes core MR measurements to relate each relaxation time to a specific fraction of capillary bound water. Thus, the bulk volume

NA, Tertiary Water from Using T2 Cutoff No Weights Used in determination

irreducible becomes a direct output of the inversion of the echo data, and it utilizes the entire T2 distribution. Core data are presented that demonstrate the Spectral Bulk Volume Irreducible (SBVI) petrophysical model and the method used for its characterization. Log examples of the SBVI implementation are presented to demonstrate the improvements brought by this development.

CC WELL LOGGING
SH *NUCLEAR MAGNETIC LOGGING
CT *CRITICAL SATURATION; *FREE FLUID INDEX; *INTERPRETATION; *MAGNETIC RESONANCE; *NUCLEAR LOGGING; *NUCLEAR MAGNETIC RESONANCE; *PHYSICAL PROPERTY; *RESONANCE; WATER OIL RATIO; WATER WETTABILITY; WAVE AMPLITUDE; WELL LOGGING DATA; WETTABILITY
RN 1317-65-3 (LIMESTONE)
1333-74-0 (HYDROGEN)

L18 ==========

ANSWER 12 OF 21 HCAPLUS COPYRIGHT 2004 ACS on STN

No Actual Determination Made
NA MF 4-30-2004

AN 2000:901885 HCAPLUS Full-text
DN 134:73721
ED Entered STN: 24 Dec 2000
TI Estimation of hydrocarbon viscosity with multiple-te, dual-tw magnetic resonance image logs
AU Chen, Songhua; Georgi, D. T.; Olima, Oscar; Gamin, Hector; Minetto, J. C.
CS Western Atlas Logging Services, USA
SO SPE Reservoir Evaluation & Engineering (2000), 3(6), 498-508
CODEN: SREEFG; ISSN: 1094-6470
PB Society of Petroleum Engineers
DT Journal
LA English
CC 51-1 (Fossil Fuels, Derivatives, and Related Products)
AB We report a case study of using NMR multiple-te, dual wait-time (tw) log acquisitions for quant. characterization of San Jorge Basin reservoir oil viscosity. Previously, dual-tw logs have been used to discern gas and oil from water, while dual-te logs have been used as a qual. light oil indicator. Although theor. simple, quant. determination of viscosity from dual-te logs is complicated by several factors, including poor signal-to-noise ratio, difficulties in separating oil from water, and the uncertainty of internal gradient strength. In the present study, multiple-te acquisitions of dual-tw logs were used to isolate the oil from the water signal. The values of viscosity of the reservoir fluids can be estimated from either intrinsic T2 or T1. In estimation of the apparent T2, we used a model that does not explicitly require knowledge of the internal gradient, thereby minimizing the effects arising from the uncertainty of the internal and tool gradient strengths. Because T1 and intrinsic T2 are estimated independently, the degree of agreement between the two values provides an indication of the reliability of the two ests. The main example in the study of four pay zones contain viscous oil. However, our anal. indicated that the viscosity values of the oil are less than 5 cP. The predictions have been substantiated by production of light hydrocarbons from the three zones that have been perforated. Further, a good agreement is obtained for the viscosity ests. based on NMR log data and laboratory pressure/volume/temperature (PVT) anal.

L18 ==========

ANSWER 13 OF 21 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1998:730311 HCAPLUS Full-text
DN 130:54539
ED Entered STN: 18 Nov 1998
TI Low-field NMR determinations of the properties of heavy oils and water-in-oil emulsions
AU Latorraca, G. A.; Dunn, K. J.; Webber, P. R.; Carlson, R. M.
CS Chevron Petroleum Technology Co., La Habra, CA, 90631, USA
SO Magnetic Resonance Imaging (1998), 16(5/6), 659-662
CODEN: MRIMDQ; ISSN: 0730-725X
PB Elsevier Science Inc.
DT Journal
LA English
CC 51-3 (Fossil Fuels, Derivatives, and Related Products)
AB Low-field (<50 mT) NMR well-logging measurements are beginning to be used to obtain ests. of oil viscosity in situ. To build an interpretive capability, we made laboratory T1 and T2

relaxation measurements on a suite of high-d., high-viscosity crude oils. These measurements were also used to estimate oil viscosity and water fraction from T1 and T2 measurements on stable, water-in-oil emulsions. High-d., high-viscosity oils have components that relax faster than can be measured by NMR logging tools. This requires corrections to T2 logging measurements for accurate ests. of oil saturation and porosity.

No Actual oil/water Fracts determined 4/30/2004

L18 ==========

ANSWER 14 OF 21 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1994:466303 HCAPLUS Full-text
DN 121:66303
ED Entered STN: 06 Aug 1994
TI Cryo-TEM and NMR Studies of Solution Microstructures of Double-Tailed Surfactant Systems: Didodecyldimethylammonium Hydroxide, Acetate, and Sulfate
AU Regev, Oren; Kang, Changjiang; Khan, Ali
CS Chemical Centre, University of Lund, Lund, S-221 00, Swed.
SO **Journal of Physical Chemistry (1994), 98(26), 6619-25**
CODEN: JPCHAX; ISSN: 0022-3654
DT Journal
LA English
CC 66-1 (Surface Chemistry and Colloids)
AB Didodecyldimethylammonium hydroxide (DDAOH) and acetate (DDAAc) are easily soluble in water, forming isotropic solution phases (0-30 wt % DDAOH and 0-32 wt % DDAAc), whereas didodecyldimethylammonium sulfate (DDAS) is sparingly soluble (≈0.2 wt %) in water. All three surfactants form lamellar phases in water at high surfactant concns. Addition of dodecane to the lamellar dispersions of DDAS yields anisotropic solution phase in the water-rich part of the triangle. Cryo-TEM, NMR self-diffusion, and 1H NMR transverse relaxation techniques have been employed to study aggregate structures in solns. for these surfactant systems. Cryo-TEM micrographs detect stable vesicles, and for solutionswith OH- and CH3COO- counterions, vesicles coexist with normalmicelles within certain concentration ranges above which micelles are the only stable aggregates. Concentration-dependent self-diffusion coeffs. measured by the PGSE NMR method show that the surfactant ions have a minimumin their self-diffusion coeffs. with both OH- and CH3COO- ions. Moreover, there is micellar growth in the dilute part of the solution regions. Mol. diffusion, i.e., the exchange of monomers between aggregates, becomes important in concentrated solns. In the ternary solution with SO42- as a counterion, near spherical oil-in-water-type droplets are formed at very high water contents, and with a decreasing water concentration at a constant molar ratio between oil and surfactant, a moderate swelling of the droplets with oil is observed At low molar ratios between oil and surfactant and low water contents, the exchange of monomers between aggregates dominates the surfactant diffusion process.

NA TAF 4/30/2004

L18 ==========

ANSWER 15 OF 21 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1993:232496 HCAPLUS Full-text
DN 118:232496
ED Entered STN: 12 Jun 1993
TI Measurement of oil in French dressing by medium-resolution, proton-magnetic-resonance spectroscopy
AU Fairbrother, P.; Rutledge, D. N.
CS Lab. Chim. Anal., Inst. Natl. Agron., Paris, 75231, Fr.
SO **Analusis (1993), 21(2), 113-17**
CODEN: ANLSCY; ISSN: 0365-4877
DT Journal
LA English
CC 17-1 (Food and Feed Chemistry)
AB A medium-resolution (20 MHz) NMR spectrometer has been used to measure the oil content of French dressing. The amount of sample employed and the position of the sample in the magnetic field were studied to maximize signal intensity without loss of resolution Anhydrous CuSO4 was added to the dressing (1% weight/weight) to relax the large water resonance and enhance detection of the much weaker oil resonance. A calibration graph relating the area ratios of the oil and water peaks to the concentration of oil was constructed. This procedure enables the oil levels of such food emulsions to be determined simply and quickly.
IT Fats and Glyceridic oils
RL: ANT (Analyte); ANST (Analytical study)
(determination of, in French dressing by medium-resolution NMR spectroscopy)

Not 2Mth or less

NA TAF 4/30/2004

IT Sunflower oil
RL: ANT (Analyte); ANST (Analytical study)
(determination of, in food emulsions by medium-resolution NMR spectroscopy)
IT Food analysis
(oil determination in, of emulsions by medium-resolution NMR spectroscopy)
IT Salad dressings
(French, oil determination in, by medium-resolution NMR spectrometry)
IT 7758-98-7, Cupric sulfate, properties
RL: PRP (Properties)
(water resonance relaxation with, in oil determination in French dressing by NMR spectrometry)

L18 ==========

ANSWER 16 OF 21 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1979:525882 HCAPLUS Full-text
DN 91:125882
ED Entered STN: 12 May 1984
TI NMR-relaxometric determination of water and petroleum content in water- and petroleum-saturated rock samples
IN Belorai, Yu. L.; Zaporozhets, M. V.; Karpova, M. V.; Neretin, V. D.; Petrosyan, L. G.; Shimelevich, Yu. S.; Yudin, V. A.
PA All-Union Scientific-Research Institute of Nuclear Geophysics and Geochemistry, USSR
SO U.S.S.R.
From: Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki 1979, (17), 155.
CODEN: URXXAF
DT Patent
LA Russian
IC G01N027-28
CC 51-2 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 61
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI SU 661320	**T**	**19790505**	**SU 1976-2423118**	**19761126**
PRAI SU 1976-2423118		**19761126**		

AB The process consists of measuring the total content of a liquid in a sample by comparing the signal amplitude from the sample with the signal amplitude of the standard upon their successive addition to a relaxometer sensor and determining the ratio **of** water **and** petroleum **phases** by recording and analyzing the proton relaxation curve. After recording the 1st relaxation curve, paramagnetic ions, which are selectively soluble in 1 of the liqs. saturating the sample, were added to the pore space of the sample, the repeated relaxation curve was compressed and from its comparison with the initial curve the water phase was uniquely determined as a relaxation curve corresponding to the component, the relaxation time of which was reduced after addition of paramagnetic ions. Paramagnetic ions were added by placing the rock sample in a solution containing Co^{2+}, Fe^{3+}, Cr^{3+}, and Cu^{2+} and a current was passed through the sample by means of electrodes (made of a material which forms paramagnetic ions during dissoln.) which were immersed in the solution
ST water detn rock NMR; petroleum detn rock NMR; NMR petroleum water detn
IT Petroleum
RL: ANT (Analyte); ANST (Analytical study)
(determination of, in petroleum-saturated rocks, by NMR relaxometry)
IT Magnetic relaxation
(in petroleum and water determination in rocks by NMR)
IT Rocks
RL: USES (Uses)
(petroleum and water determination in, by NMR relaxometry)
IT 7732-18-5, analysis
RL: ANT (Analyte); ANST (Analytical study)
(determination of, in water-saturated rocks, by NMR relaxometry)

No Dist Measurement
NA 4/3/2004

L18 ==========

ANSWER 21 OF 21 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN

AN 94:41448 AGRICOLA Full-text
DN IND20395759
TI **Maturity evaluation of avocados by NMR methods.**
AU Chen, P.; McCarthy, M.J.; Kauten, R.; Sarig, Y.; Han, S.
AV DNAL (58.8 J82)
SO **Journal of agricultural engineering research, July 1993. Vol. 55, No. 3. p. 177-187**
Publisher: London ; Orlando : Academic Press, 1956-
CODEN: JAERA2; ISSN: 0021-8634
NTE Includes references
CY England; United Kingdom
DT Article
FS Non-U.S. Imprint other than FAO
LA English
AB Nuclear magnetic resonance (NMR) experiments were conducted to find desirable methods for maturity evaluation of avocado fruits. NMR image intensity, the ratio of the oil and water resonance peaks of the one-dimensional NMR spectrum, and both the spin-lattice relaxation time (T1) and spin-spin relaxation time (T2) of water in the fruit were found to correlate with maturity of the fruit. The technique of using a surface-coil NMR probe to obtain the oil/water resonance peak ratio of the signal from a region of an intact fruit produced the best result and has desirable features for high-speed sorting.
CC N200 Farm and Structural Equipment
CT avocados; correlated traits; evaluation; fruit; high speed operation; imagery; maturity; mechanical methods; nuclear magnetic resonance; sensors; sorting

NOA Fluid Emulsion NA TAF 4/30/2004

L28 ==========

ANSWER 3 OF 6 TULSA COPYRIGHT 2004 UTULSA on STN

AN 86:16684 TULSA Full-text
DN 410178
TI MICROSTRUCTURE OF MICROEMULSIONS OF THE SYSTEM H2O- N-TETRADECANE-C12E5
AU LICHTERFELD, F; SCHMELING, T; STREY, R
CS MAX PLANCK INST
SO **J PHYS CHEM V 90, NO 22, PP 5762-5766, 10/23/86 (ISSN 00223654; 47 REFS)**
DT Journal
LA English
AB This paper presents small-angle X-ray spectra of the homogeneous and the lamellar phase in the system H2O-n- tetradecane-C12E5, measured along well-defined paths through the phase prism. The investigations are based on the features of the phase behavior of such systems reported earlier. The variation of the single sharp peak in the lamellar phase with composition is typical for one- dimensional swelling. For homogeneous microemulsions adjacent to the body of heterogeneous phases, a single broad scattering maximum was found, the position and intensity of which varies systematically with composition. The variation of the corresponding Bragg spacing is found to be inconsistent with a layered, lamellar-like structure. NMR-self-diffusion work on the same system ruled out closed droplet structures at **comparable** water **and** oil **volume** fractions; instead, bicontinuity was established. The results are consistent with a disordered bicontinuous interspersion of water- and oil-rich domains with practically all amphiphile concentrated at the well-defined internal interface.
CC RESERVOIR ENG. & RECOVERY METHODS
SH *MICROEMULSION
CT *EMULSION; *MICROSTRUCTURE; *MIXTURE; *MODEL; *MOLECULAR MODEL; *MOLECULAR STRUCTURE; *PHASE BEHAVIOR; *STRUCTURE; ADDITIVE; ANALYTICAL METHOD; AREA; CHART; COMPOSITION; DATA; DEFLECTION; DIAGRAM; DROP; ETHER; EXPERIMENTAL DATA; FILM; GLYCOL ETHER; GRAPH; INTENSITY; INTERFACE; LAYER; LIGHT SCATTERING; MAGNETIC RESONANCE; MULTICOMPONENT MIXTURE; NUCLEAR MAGNETIC RESONANCE; PHASE DIAGRAM; RESONANCE; SCATTERING; SPACING; SPECIFIC SURFACE; SPECTRAL ANALYSIS; SURFACE ACTIVE AGENT; SURFACE AREA; TERNARY MIXTURE; TESTING; TETRADECANE; WATER; WATER OIL RATIO; X RAY SPECTROSCOPY
RN 629-59-4 (TETRADECANE)

No Fluid Emulsion NA TAF 4/30/2004

L28 ==========

ANSWER 6 OF 6 PASCAL COPYRIGHT 2004 INIST-CNRS. ALL RIGHTS RESERVED. on STN

AN 1999-0048607 PASCAL Full-text

CP Copyright .COPYRGT. 1999 INIST-CNRS. All rights reserved.

TIEN **Low-field NMR determinations of the properties of heavy oils and water-in-oil emulsions**

AU LATORRACA G. A.; DUNN K. J.; WEBBER P. R.; CARLSON R. M.
BORGIA Giulio C. (ed.); FANTAZZINI Paola (ed.); GORE J. C. (ed.); STRANGE John H. (ed.)

SO **Magnetic resonance imaging, (1998), 16(5-6), 659-662, 5 refs.**
Conference: 4 International Meeting on Recent Advances in MR Applications to Porous Media, Trondheim (Norway), 31 Aug 1997
ISSN: 0730-725X CODEN: MRIMDQ

DT Journal; Conference; Short communication

BL Analytic

CY United States

LA English

AV INIST-19716, 354000070658410450

AB Low-field (<50 mT) nuclear magnetic resonance (NMR) well-logging measurements are beginning to be used to obtain estimates of oil viscosity in situ. To build an interpretive capability, we made laboratory T.sub.1 and T.sub.2 relaxation measurements on a suite of high-density, high-viscosity crude oils. These measurements were also used to estimate oil viscosity and water fraction from T.sub.1 and T.sub.2 measurements on stable, water-in-oil emulsions. High-density, high-viscosity oils have components that relax faster than can be measured by nuclear magnetic resonance logging tools. This requires corrections to T.sub.2 logging measurements for accurate estimates of oil saturation and porosity.

CT Water oil emulsion; Low field; Heavy oil; Nuclear magnetic resonance imaging; Viscosity; In situ; Spin spin relaxation; Spin lattice relaxation; Porosity; Accuracy; Saturation

No Acid Water/Oil Determinations / Facts only Estimate - NA TAF 4/30/2004

L28 ==========

ANSWER 5 OF 6 **WPIX COPYRIGHT THOMSON DERWENT on STN**

AN 1999-429462 [36] WPIX Full-text

DNC C1999-126485

TI Treatment of heavy hydrocarbon oil feed to reduce total acid number and increase API gravity.

DC H01 H04

IN CASPARY, M T; DECANIO, S J; SUDHAKAR, C

PA (TEXC) TEXACO DEV CORP; (TEXC) TEXACO INC

CYC 3

PI US 5928501 A 19990727 (199936)* 8 C10G017-00
CN 1229834 A 19990929 (200003) C10G045-04
CA 2260649 A1 19990803 (200004) EN C10G045-66

ADT US 5928501 A US 1998-17587 19980203; CN 1229834 A CN 1999-100898 19990203; CA 2260649 A1 CA 1999-2260649 19990202

PRAI US 1998-17587 19980203

IC ICM C10G017-00; C10G045-04; C10G045-66
ICS B01J023-85; B01J037-28

AB US 5928501 A UPAB: 19990908
NOVELTY - Treatment of a heavy hydrocarbon oil feed comprises:
(a) Forming a slurry which includes a heavy hydrocarbon oil and a catalytically effective amount of a catalyst composition comprising a non-Nobel metal of Group VIII of the periodic table and a metal of Group VIB of the periodic table on a phosphorus-treated carbon support;
(b) Introducing the slurry into a reaction zone in the presence of hydrogen; and
(c) Subjecting the slurry to acid number reducing conditions to provide a hydrocarbon oil product having an improved API gravity.
USE - The process treats a hydrocarbon oil feed to reduce total acid number (TAN) and increase API gravity (claimed). It provides a method for upgrading a heavy oil feedstock by catalyst assisted hydrotreatment.
ADVANTAGE - Deposit formation is minimized or avoided. Dwg.0/1

TECH US 5928501 A UPTX: 19990908
TECHNOLOGY FOCUS - CHEMICAL ENGINEERING - Preferred catalyst: The catalyst includes 0.1-15 wt % of at least one metal selected from iron, cobalt and

NA TAF 4/30/2004

nickel, and from 1-50 wt % of at least one metal selected from chromium, molybdenum and tungsten and the phosphorus-treated carbon support is characterized by:
(1) having been prepared by heat treating mixtures of activated carbon and phosphorus compounds at temperatures greater than 450degreesC;
(2) the phosphorus existing in the phosphorus treated carbon being bound to the carbon surface predominantly as polyphosphate species characterized by peaks between -5 and -30 ppm in the solid-state magic angle spinning 31P NMR spectrum; and
(3) having a B.E.T. surface area of 100 - 2000 m2/g, a total pore volume for nitrogen of at least 0.3 ml/g and an average pore diameter of 12-100 A. The hydrocarbon oil feed comprises an oil selected from whole crude oil, dewatered crude oil, desalted crude oil, topped crude oil, deasphalted oil, vacuum gas oil, petroleum residua, water emulsion of crude oil, water emulsions of heavy fractions of crude oils, oil from coal liquefaction, shale oil and tar sand oil. The hydrocarbon oil feed has no measurable total acid number and an API gravity of no more than 25degrees. The slurry is a uniform suspension of the catalyst in the hydrocarbon oil feed. The process further includes the step of separating out the catalyst from the hydrocarbon oil product and recycling the separated catalyst, with or without regeneration, to the hydrocarbon oil feed. The acid number of the hydrocarbon oil product is less than 50 % that of the hydrocarbon oil feed. The API gravity of the hydrocarbon oil product is at least about 1 degree higher than that of the hydrocarbon oil feed. The acid number reducing conditions include a reaction temperature of 250-500degreesC, a pressure of 200 psig-1500 psig, a liquid hourly space velocity of 0.1-5.0 and a hydrogen feed rate of 100-10000 SCFB. The reaction temperature is 380-450degreesC and the reaction pressure is 200-1,000 psig. The catalyst concentration in the slurry is 0.01-10 wt %. The catalyst is used with or without presulfiding. The catalyst is sulfided in situ by adding a decomposable sulfur compound to the hydrocarbon oil feed before passing the slurry into the reaction zone. A portion of hydrogen sulfide generated in the process is recycled back into the process. The catalyst contains 1-20 wt % of at least one metal selected from chromium or molybdenum. The catalyst may contain 1-50 wt % tungsten. The catalyst may contain 2-12 wt % nickel, 10-45 wt % tungsten, and the carbon support contains 2.5-10 wt % phosphorus. The catalyst includes 0.01-4 wt % of a promoter selected from boron and fluorine. The process further includes the step of heat soaking the hydrocarbon oil product. The hydrogen used is of at least 60 % purity.

ABEX US 5928501 A UPTX: 19990908

EXAMPLE - A crude oil was provided having API gravity of 15degrees. A stainless steel tubular reactor was provided. The tube had no internal structures. The internal volume of the reactor in the heated zone was 120 cc. Prior to running the experiment the weight of the reactor tube was determined. A carbon supported Ni-W catalyst containing 37 % W and 7.5 % Ni was provided. The carbon support of the catalyst contained 5 % phosphorus. The catalyst was finely ground and the fraction passing through a 400 mesh screen was thoroughly blended with the crude oil in a high speed blender, 7.5 g of catalyst being added to 3,000 g of crude oil to form a reactor feed slurry. No sulfiding agent was added. The slurry was fed into the reactor at 140 g/hour with a hydrogen flow of 600 cc/min. The reactor temperature was programmed to increase gradually to a predetermined reaction temperature of 417degreesC, in about 60 minutes and remain constant thereafter. The time when the temperature reached the predetermined reaction temperature was taken as the starting time of the reaction. The total pressure was then adjusted to the desired pressure of 400 psig. Liquid product samples were collected at various reaction times on stream at one hour intervals and were degassed with the help of an ultrasonic bath before they were analyzed for their sulfur, carbon, hydrogen and nitrogen contents. The sulfur content of the feed and product samples were determined by x-ray fluorescence spectroscopy and other analysis were carried out. At the end of the run, light petroleum naphtha was pumped through the reactor at 400 cc/hour while the reactor cooled down to remove all remaining crude oil. The naphtha was then removed from the reactor by applying vacuum. The vacuum was then weighed again, the difference between the final weight and the initial weight indicating the increase in weight attributable to deposits formed on the interior walls of the reactor. From product analysis: API gravity increase = 3.5degrees; sulfur reduction = 9 %; TAN reduction = 50 %; pitch conversion = 12 %; 50 % boiling point = 390degreesC; and reactor weight gain = negligible.

L30 ==========

NA TAT 4/30/2004

ANSWER 1 OF 2 TULSA COPYRIGHT 2004 UTULSA on STN
AN 91:9501 TULSA Full-text
DN 503900
TI NET PAY APPLICATION FOR NUCLEAR MAGNETIC RESONANCE, NUGGET SANDSTONE, WYOMING THRUST BELT
AU SERCOMBE, W J; ANDERSON, B R
CS AMOCO PRODUCTION CO
SO 4TH ANNU SOC CORE ANAL TECH CONF (DALLAS, 8/14-16/90) PREPRINTS V 2, PAP NO SCA-9026, 1990 (23 PP; 7 REFS)
DT Conference; Conference Article
LA English
AB Nuclear magnetic resonance (NMR) test results from the Jurassic Nugget Sandstone in the Wyoming thrust belt were combined with other core tests to develop net pay criteria that would reflect **water** cut and deliverability in addition to hydrocarbon pore volume. The producing characteristics of the Nugget Sandstone had previously been correlated to eolian dune facies in the first several years of thrust belt exploration. Inconsistencies in facies-to-pay correlations from new discoveries and longer production histories required a new method to evaluate net pay that would evaluate the impact of connate water saturation on reservoir behavior. This NMR pay method approach integrates relative permeability, capillary pressure, and NMR test evaluations and resultant estimates of reservoir behavior affected by connate water saturation. These tests quantify fractional flow, pore throat size, and relative permeability for any selected water saturation value.
CC RESERVOIR ENG. & RECOVERY METHODS
SH *NET PAY VOLUME
CT *CAPACITY (ROCK); *FORMATION THICKNESS; *GAS WELL CAPACITY; *MAGNETIC RESONANCE; *NUCLEAR MAGNETIC RESONANCE; *NUGGET SANDSTONE; *PHYSICAL PROPERTY; *PRODUCING CAPACITY; *RESERVOIR ZONATION; *RESONANCE; *ROCK PROPERTY; *THICKNESS; *VOLUME; *ZONATION; AMPLITUDE; ANALYTICAL METHOD; ANSCHUTZ RANCH E GAS CON F; BASE MAP; CAPILLARITY; CAPILLARY PHENOMENON; CAPILLARY CONTACT; GAS WATER RATIO;

ND Actual Measurement
NA TAF 4/30/2004

L30 ==========
ANSWER 2 OF 2 PASCAL COPYRIGHT 2004 INIST-CNRS. ALL RIGHTS RESERVED. on STN
AN 1999-0124724 PASCAL Full-text
CP Copyright .COPYRGT. 1999 INIST-CNRS. All rights reserved.
TIEN Estimation of hydrocarbon viscosity with multiple TE dual wait-time MRIL logs
Formation evaluation and reservoir geology : New Orleans LA, 27-30 September 1998
AU SONGHUA CHEN; OLIMA O.; GAMIN H.; GEORGI D. T.; MINETTO J. C.
CS Western Atlas Logging Services, Houston, TX, United States; YPF S.A., Comodoro Rivadavia, Argentina; Western Atlas Logging Services, Comodoro Rivadavia, Argentina
SO Society of Petroleum Engineers, Richardson TX, United States (patr.) (1998), 213-226, 8 refs.
Conference: SPE annual technical conference, New Orleans LA (United States), 27 Sep 1998
Published by: SPE, Richardson TX
DT Conference
BL Analytic
CY United States
LA English
AV INIST-IFPC1164, 354000073166320170
AB In this paper, we report a successful example of using multiple TE dual wait-time (TW) log acquisitions for quantitative characterization of San Jorge Basin reservoir oil viscosity. Previously, dual TW logs have been used to separate gas and oil, while dual TE logs have been used as a qualitative light oil indicator. Although theoretically simple, quantitative determination of viscosity from dual TE logs is complicated by several factors, including poor signal-to-noise ratio, difficulties in **separating** oil **from** water, and the uncertainty of internal gradient strength. We used multiple TE acquisitions of dual TW logs to isolate the oil from the water signal. The values of viscosity of the reservoir fluids can be estimated from three NMR properties: intrinsic T.sub.2, apparent T.sub.2, and T.sub.1. All three approaches have advantages and disadvantages. Since T.sub.1 estimates are not affected by diffusion, the uncertainty in the internal field gradient has no effect on T.sub.1-based viscosity. However, T.sub.1 is difficult to estimate because it relies on small differences in the dual TW echo data. In estimation of the apparent T.sub.2, we used a model that does

not explicitly require knowledge of the internal gradient, thereby minimizing the effects arising from the uncertainty of the internal and tool gradient strengths. Since T.sub.1 and intrinsic T.sub.2 are estimated independently, the degree of agreement between the two values provides an indication of the reliability of the two estimates. The method has been used successfully in San Jorge Basin, Argentina. Three values of TE, 1.2, 2.4, and 3.6 ms were used and a dual TW log was acquired for each TE. The data were analyzed without need for other geological information or log data from other logging tools. To complicate the matter, previous NMR core analysis of the core plugs cut from another well in San Jorge Basin showed great porosity and permeability variations. Furthermore, no reliable reservoir fluid measurements were available. Thus, interpretation was based only on the NMR log data. The four zones selected for this study were thought to contain heavy, viscous oil. However, our analysis indicated that the viscosity values of the oil are less than 5 cP. Our predictions have been substantiated by production of light hydrocarbons from the three zones that have been perforated. Further, viscosity measurements on the reservoir fluid from one of the three zones is 2.6 cP, which is in good agreement with the NMR -derived estimate of 3.3 cP.

CC 001D06B02B2B; Applied sciences; Energy; Fuels
230; Energy

CT NMR logging; Nuclear magnetic resonance imaging; Petroleum; Viscosity; Echo time; Data processing; Computing method; Spin spin relaxation; Theoretical study

NA TAF 4/30/2004

L32 ==========

ANSWER 1 OF 3 TULSA COPYRIGHT 2004 UTULSA on STN

AN 97:3726 TULSA Full-text

DN 643560

TI METHOD AND APPARATUS FOR DETERMINING FLOW RATES IN MULTI-PHASE FLUID FLOW MIXTURES

IN CARLSON, N R; DAVARZANI, M J

PA WESTERN ATLAS INTERNAT INC

PI US 5586027 19961217

AI US 19951113

PRAI US 1989-364889 19890612

PRAI US 1991-697538 19910430

PRAI US 1992-963000 19921019

PRAI US 1993-90480 19930712

PRAI US 1994-213457 19940314

PRAI US 1995-384603 19950203

SO US 5,586,027, C 12/17/96, F 11/13/95, PR US 6/12/89 (APPL 364,889), US 4/30/91 (APPL 697,538), US 10/19/92 (APPL 963,000), US 7/12/93 (APPL 90,480), US 3/14/94 (APPL 213,457) AND US 2/3/95 (APPL 384,603) (G06F-019/00; E21B-047/00) (14 PP; 4 CLAIMS)

DT Patent

LA English

AB A method and an apparatus are described for determining the water cut of an oil-water flow in a well bore having a known deviation angle less than 90(deg). A first step includes generating a set of predicted response curves related to measured responses of a selected logging instrument capable of distinguishing between the water and oil phases of the flow mixture for a selected oil-water total flow rate and at a borehole deviation within a selected range of deviation values that include the known borehole deviation. Then the selected logging instrument combination is introduced into the borehole for measuring the total flow rate of the oil-water mixture and the values representative of the responses of the selected logging instrument distinguishing **between the oil and water phases of the oil-water mixture.** A value functionally related to the measured value representative of the responses of the selected logging instrument is generated. From the set of predicted response curves, an estimated value of the water cut of the oil-water mixture at the measured borehole total flow rate of the oil-water mixture is determined in response to the generated value functionally related to the measured value representative of the responses of the selected logging tool.

IC ICM G06F019-00
ICS E21B047-00

No Actual Water/oil Fractions Reported only Estimates TAF 4/30/2004

CC WELL LOGGING

SH *FLUID ENTRY PROFILING

CT *COMPOSITION; *DIRECTIONAL WELL; *FLOW MEASURING; *FLUID ENTRY; *MEASURING; *PRODUCTION LOGGING; *PROFILING; *TESTING; *WATER OIL RATIO; *WELL; *WELL LOGGING; ALGORITHM;

L32 ==========

ANSWER 2 OF 3 TULSA COPYRIGHT 2004 UTULSA on STN

AN 89:6079 TULSA Full-text

DN 458342

TI MICROEMULSIONS WITH NONIONIC SURFACTANTS : PT.1 : DIFFUSION PROCESS OF OIL MOLECULES

AU OLSSON, U; WENNERSTROM, H; NAGAI, K

CS LUND UNIV; NAGASAKI UNIV

SO J PHYS CHEM V 92, NO 23, PP 6675-6679, 11/17/88 (ISSN 00223654; 31 REFS)

DT Journal

LA English

AB The molecular self-diffusion in a microemulsion system composed of 7.0% by wt pentaethylene glycol dodecyl ether, water, and a 1:1 by wt mixture of cyclohexane and hexadecane was investigated by using the Fourier transform pulsed-gradient spin-echo 1H NMR technique. The purpose of the mixing of 2 oils was to reveal information concerning the diffusion processes responsible for the observed macroscopic transport of oil molecules in microemulsion systems. The study was performed in an isotropic solution phase that at a constant surfactant concentration of 7.0% (w/w) exists over the whole range of water-to-oil ratios. For the majority of compositions the dominating diffusion process is a molecular diffusion in an oil medium. This process is at low oil content achieved by rapid fusion- fission of micellar aggregates, and a significant polydispersity is suggested to explain the magnitude of the diffusion coefficients. The present study also distinguishes at low temperature and oil content, the presence of closed swollen micelles (O/W microemulsion) where the dominating diffusion process is aggregate diffusion. The transition from dominating aggregate diffusion to a dominating molecular diffusion is induced by a slight (2(deg)C) increase in temperature and is accompanied by a significant growth in size of the swollen micelles.

CC SUPPLEMENTAL TECHNOLOGY

SH *MICROEMULSION

CT *ADDITIVE; *CYCLOHEXANE; *DIFFUSION; *DIFFUSION COEFFICIENT; *EMULSION; *HEXADECANE; *MIXTURE; *PHASE BEHAVIOR; *SURFACE ACTIVE AGENT; ANALYTICAL METHOD; CHART; COMPOSITION; COMPOUND; DERIVATIVE (CHEMICAL); DIAGRAM; DODECYL ETHER; ETHER; FOURIER TRANSFORM; FUNCTION (MATHEMATICS); GLYCOL ETHER; MAGNETIC RESONANCE; MATHEMATICS; MOLECULAR STRUCTURE; NMR SPECTROSCOPY; NONIONIC; NUCLEAR MAGNETIC RESONANCE; OIL CONTENT; OIL IN WATER EMULSION; PHASE DIAGRAM; PHYSICAL PROPERTY; RESONANCE; SPECTRAL ANALYSIS; STRUCTURE; TEMPERATURE; TESTING; WATER IN OIL EMULSION

RN 544-76-3 (HEXADECANE)
4542-57-8 (DODECYL ETHER)
110-82-7Q, 25012-93-5Q (CYCLOHEXANE)

4-30-2004
NA PAF
No measurement of oil/water Content
only that oil/water Are present

L32 ==========

ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1988:616498 HCAPLUS Full-text

DN 109:216498

ED Entered STN: 10 Dec 1988

TI Microemulsions with nonionic surfactants. 1. Diffusion process of oil molecules

AU Olsson, U.; Nagai, K.; Wennerstroem, H.

CS Chem. Cent., Univ. Lund, Lund, S-221 00, Swed.

SO Journal of Physical Chemistry (1988), 92(23), 6675-9
CODEN: JPCHAX; ISSN: 0022-3654

DT Journal

LA English

CC 66-2 (Surface Chemistry and Colloids)

AB The mol. self-diffusion in a microemulsion system containing 7.0 weight% H2O, and a 1:1 (by weight) mixture of cyclohexane and hexadecane was investigated by using Fourier transform pulsed-gradient spin-echo 1H NMR. The purpose of the mixing of 2 oils was to reveal information concerning the diffusion processes responsible for the observed macroscopic transport of oil mols. in microemulsion systems. The study was performed in an isotropic solution phase that at a constant surfactant concentration of 7.0 weight% exists over the whole range of water-to-oil ratios. For the majority of compns. the dominating diffusion process is a mol. diffusion in an oil medium. This process is at low oil content achieved by rapid fusion-fission of micellar aggregates, and a significant polydispersity is suggested to explain the magnitude of the diffusion coeffs. The present study also distinguishes, at low

temperature and oil content, the presence of closed swollen micelles (O/W microemulsion) where the dominating diffusion process is aggregate diffusion. The transition from dominating aggregate diffusion to a dominating mol. diffusion is induced by a slight (2°) increase in temperature and is accompanied by a significant growth in size of the swollen micelles. At equal volume fractions of H2O and oil a tubular structure can be ruled out by the present data.

NA TAF 4-30-2004

L46 ==========

ANSWER 10 OF 12 WPIX COPYRIGHT THOMSON DERWENT on STN

AN 1997-350365 [32] WPIX Full-text
CR 1995-074218 [10]
DNN N1997-290432 DNC C1997-113122
TI Petroleum analyser using microwave energy to derive solid/liquid ratio - in which the detected energy is compared to map of attenuated amplitude versus phase for a set of reference petroleum streams having known solid, oil and water contents.
DC H01 S03 W06
IN BROST, D F; MARRELLI, J D; PEPIN, L L; SIDDIOUI, F; STAFFORD, J D
PA (TEXC) TEXACO INC
CYC 1
PI US 5644244 A 19970701 (199732)* 4 G01N022-04
ADT US 5644244 A CIP of US 1991-718665 19910621, US 1995-374002 19950118
FDT US 5644244 A CIP of US 5383353
PRAI US 1995-374002 19950118; US 1991-718665 19910621
IC ICM G01N022-04
AB US 5644244 A UPAB: 19970806
Method for measuring a petroleum stream having an immiscible flow of solids, water and oil, comprises: (a) directing an incident beam of microwave energy of 10 - 12 gigahertz frequency through the petroleum stream; (b) detecting attenuated microwave energy passing through the stream and using the detected reflected energy to measure the relative phase of the incident microwave energy and the attenuated microwave energy; and (c) comparing the relative phase and amplitude attenuation of the attenuated microwave energy to an empirically derived reference map of amplitude attenuation as a function of relative phase shift for a set of reference petroleum streams having known, but varied, percentages of solids, oil and water to derive the ratio of solids to liquids in the measured petroleum streams.

USE - Petroleum analyser using microwave energy to derive solid/liquid ratio.

ADVANTAGE - The detected microwave energy is compared to map of attenuated amplitude vs. phase for a set of reference petroleum streams having known solid, oil and water contents, to derive the required oil/liquid ratio of the stream. Dwg.1/2

FS CPI EPI
FA AB; GI
MC CPI: H01-D12
EPI: S03-E05; S03-E14E1; S03-F06A; W06-A04H8

NA Low Fld NMR NA TAF 4/30/2004

L46 ==========

ANSWER 11 OF 12 WPIX COPYRIGHT THOMSON DERWENT on STN

AN 1982-P8522E [45] WPIX Full-text
TI Standard measure for NMR oil seed tests - using paramagnetic salt solution and elastomer with suitable mass ratio as models for oil and water.
DC S03
IN ASPIOTIS, E K H; LAKHOV, V M; VITYUK, B Y A
PA (ASPI-I) ASPIOTIS E KH
CYC 1
PI SU 898306 B 19820115 (198245)* 4
PRAI SU 1980-2927283 19800516
IC G01N024-10
AB SU 898306 B UPAB: 19930915
A standard measure for the calibration and check of nuclear magnetic resonance (NMR) analyzers of the oilines and moisture of linseed cultures consists of a cylindrical ampoule (1) which has an internal cylindrical cavity (2) containing an elastomer (3). The annular cavity (4) around it holds an amount of an aqueous solution of a paramagnetic salt (5). A sealant (6,7) is used to close the inner and outer cavity.

The solution (5) is a proton containing subtance with a spin-spin relaxation time corresponding to that of the oil protons in the linseed cultures. The elastomer (3) has a spin-spin relaxation time corresponding to that of water protons.

The mass ratio of the two substances (3,5) must be such as to simulate the amplitude ratio of the NMR signals from oil and water in the seeds. This reduces the cost and simplifies the technology of preparing such a standard measure. Bul. 2/15.1.82.
1/1
FS EPI
FA AB
MC EPI: S03-E07

NA TAF 4/30/2004

L46 ==========
ANSWER 12 OF 12 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
AN 97:45648 AGRICOLA Full-text
DN IND20573958
TI Development of a high speed NMR techniques for sensing maturity of avocados.
AU Chen, P.; McCarthy, M.J.; Kim, S.M.; Zion, B.
CS University of California, Davis, CA.
SO **Transactions of the ASAE, Nov/Dec 1996. Vol. 39, No. 6. p. 2205-2209**
Publisher: St. Joseph, Mich. : American Society of Agricultural Engineers 1958-
CODEN: TAAEAJ; ISSN: 0001-2351
NTE avocades
Includes references
CY Michigan; United States
DT Article
FS U.S. Imprints not USDA, Experiment or Extension
LA English
AB This study demonstrates the feasibility of using an NMR technique for high-speed on-line sensing of maturity of avocados. Results of our previous studies indicate that it is possible to use high-speed, single-pulse NMR techniques to evaluate quality of fruits and vegetables. The single-pulse free induction decay (FID) spectrum measurement technique was used successfully to evaluate maturity of avocados and sugar content of fresh prunes, and was found to have desired features for high-speed sensing of fruit quality. In this study we successfully used a specially designed conveyor belt to acquire FID spectra of avocados while they were moving at speeds up to 250 mm/s. The oil/water resonance peak ratio, obtained from the spectrum, correlates very well (r2 = 0.98) with the dry weight of the fruit.
CC Q505 Food Composition, Horticultural Crop Products
CT avocados; food quality; maturity; nondestructive testing; nuclear magnetic resonance; sorting conveyors; spectrometry; water content
ST free induction decay spectra; oil content; water and oil mobility

NA Fluid Emulsion Fruits and Solids TAF 4/30/2004

L59 ==========
ANSWER 6 OF 12 TULSA COPYRIGHT 2004 UTULSA on STN
AN 2001:4246 TULSA Full-text
DN 746574
TI **NMR TECHNOLOGY ENHANCES FORMATION EVALUATION, TESTING AND COMPLETION DECISIONS IN INDONESIA**
AU MCDONALD, T; ALY, M; DAVIS, B
CS SCHLUMBERGER GEOQUEST; SCHLUMBERGER WIRELINE TEST
SO 27TH ANNU INDONES PETROL ASS CONV (JAKARTA, INDONESIA, 2/1-3/2000) PROC V 2, PP 37-49, 2000 (IPA99-G-130; COLOR; 2 REFS)
DT Conference; Conference Article
LA English
AB Over the last several years, use of borehole NMR measurements have become more commonplace. This is due to a better understanding of the measurement by the service and operating companies, and new applications that have been developed. In most wells drilled in Indonesia, basic evaluation tools will deliver an adequate evaluation. However, there are formations that are difficult to evaluate due to any number of issues. NMR measurements provide new petrophysical parameters that can help deal with some of these difficulties. Producibility is another issue that standard logs do not address very well. This leads to a need for well testing, either with wireline formation testers or drill stem tests. NMR measurements can give

NA TAF 4/30/2004

a continuous quantitative indication of rock quality and permeabilty in lieu of these tests. Several case studies from wells in Indonesia are presented where NMR measurements have been used by asset teams to solve difficult evaluation problems.

CC WELL LOGGING

SH *NUCLEAR MAGNETIC LOGGING

CT *FORMATION EVALUATION; *FREE FLUID INDEX; *INTERPRETATION; *MAGNETIC RESONANCE; *NUCLEAR LOGGING; *NUCLEAR MAGNETIC RESONANCE; *PHYSICAL PROPERTY; *POROSITY; *POROSITY DISTRIBUTION; *RESONANCE; *ROCK PROPERTY; *SATURATION; *WATER SATURATION; *WELL LOGGING; ALKALI METAL; AMPLITUDE; ANALYTICAL METHOD; ARGILLACEOUS DEPOSIT; ARGILLACEOUS METHOD; WATER; WATER (SUBSURFACE); WATER OIL RATIO; WATER RESISTIVITY; WAVE AMPLITUDE; WELL LOG INTERPRETATION; WELL LOGGING DATA

RN 1333-74-0 (HYDROGEN)
7439-89-6 (IRON)

NA IAF 4/30/2004